

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

(Case No. MBHB00-882-I; 400/118)

IN THE APPLICATION OF:)	
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McSwiggen et al.)	
)	
Serial No. TBA)	Examiner: TBA
)	
Filed: TBA)	Group Art Unit: TBA
)	
Title METHOD AND REAGENT FOR THE)	Confirmation No.: TBA
INHIBITION OF TELOMERASE ENZYME)	

INFORMATION DISCLOSURE STATEMENT

Mail Stop Patent Application
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

Pursuant to the duty of disclosure provided by 35 C.F.R. § 1.56 and §§ 1.97-98, the applicants wish to make the following references of record in the above-identified application. This application is a continuation of U.S. Patent Application No. 09/653,225 filed August 31, 2000 and is relied upon for an earlier filing date under 35 U.S.C. § 120. In accordance with Rule 37 CFR §1.98(d), all references have been previously cited and submitted to the Patent and Trademark Office with the prior application (USSN 09/653,225) and no references are enclosed herein. All references cited are also listed in the PTO-1449 form enclosed herewith. It is requested that each document cited (including any cited in applicant's specification which is not repeated on the attached Form PTO-1449) be given thorough consideration and that it be cited of record in the prosecution history of the present application by initialing on Form PTO-1449. Such initialing is requested even if the Examiner does not consider a cited document to be sufficiently pertinent to use in a rejection, or

otherwise does not consider it to be prior art for any reason, or even if the Examiner does not believe that the guidelines for citation have been fully complied with. This is requested so that each document becomes listed on the face of the patent issuing on the present application.

Portions of the references may be material to the examination of the pending claims, however no such admission is intended. 37 C.F.R. 1.97 (h). The references have not been reviewed in sufficient detail to make any other representation and, in particular, no representation is intended as to the relative importance of any portion of the references. This Statement is not a representation that the cited references have effective dates early enough to be "prior art" within the meaning of 35 U.S.C. sections 102 or 103.

CITED REFERENCES

Foreign Patent Documents

	Document Number	Date	Country
*	EP 0 360 257	09/20/89	EP (Hampel et al.)
*	WO 91/03162	03/21/91	WO (Rossi et al.)
*	WO 92/07065	04/30/92	WO (Eckstein et al.)
*	WO 93/15187	08/05/93	WO (Usman et al.)
*	WO 93/23057	11/25/93	WO (Thompson, et al.)
*	WO 93/23569	11/25/93	WO (Draper et al.)
*	WO 94/02595	02/03/94	WO (Sullivan et al.)
*	WO 95/04818	02/16/95	WO (Draper et al.)
*	WO 95/11304	04/27/95	WO (Usman et al.)
*	WO 95/13380	05/18/95	WO (Draper et al.)
*	WO 95/23225	08/31/95	WO (Stinchcomb et al.)
*	WO 96/10390	04/11/96	WO (Ansell, et al.)

*	WO 96/10391	04/11/96	WO (Choi et al.)
*	WO 96/10392	04/11//96	WO (Holland et al.)
*	WO 96/18736	06/20/96	WO (Beigelman)
*	WO 96/19577	06/27/96	WO (Collins)
*	WO 96/22689	08/01/96	WO (Pyle et al.)
*	WO 97/26270	07/24/97	WO (Wincott et al.)
*	WO 98/01542	01/15/98	WO (Collins et al.)
*	WO 98/13526	04/02/98	WO (Woolf et al.)
*	WO 98/14592	04/09/98	WO (Cech et al.)
*	WO 98/14593	04/09/98	WO (Cech et al.)
*	WO 98/28317	07//02/98	WO (Karpiesky et al.)
*	WO 98/43993	10/08/98	WO (Breaker et al.)
*	WO 98/58058	12/23/98	WO (Ludwig et al.)
*	WO 99/16871	04/08/99	WO (Eckstein et al.)
*	WO 99/55857	11/04/99	WO (Beigelman et al.)

Other Documents (Including Author, Title, Date, Pertinent Pages, Etc).

- * Abramovitz et al., "Catalytic Role of 2'-Hydroxyl Groups Within a Group II Intron Active Site," Science 271:1410-1413 (1996)
- * Akhtar and Juliano, "Cellular Uptake and Intracellular Fate of AntiSense Oligonucleotides," Trends Cell Biol. 2:139-144 (1992)
- * Banerjee and Turner, "The Time Dependence of Chemical Modification Reveals Slow Steps in the Folding of a Group I Ribozyme," Biochemistry 34:6504-6512 (1995)
- * Beaudry and Joyce, "Directed Evolution of an RNA Enzyme," Science 257:635-641 (1992)
- * Beigelman et al., "Chemical Modification of Hammerhead Ribozymes," J. Biol. Chem. 270:25702-25708 (1995)

- * Bellon et al., "Amino-Linked Ribozymes: Post-Synthetic Conjugation of Half-Ribozymes," *Nucleosides & Nucleotides* 16:951-954 (1997)
- * Berzal-Herranz et al., "Essential nucleotide sequences and secondary structure elements of the hairpin ribozyme," *EBMO J.* 12:2567-2574 (1993)
- * Berzal-Herranz et al., "In vitro selection of active hairpin ribozymes by sequential RNA-catalyzed cleavage and ligation reactions," *Genes & Development* 6:129-134 (1992)
- * Bevilacqua et al., "A Mechanistic Framework for the Second Step of Splicing Catalyzed by the *Tetrahymena* Ribozyme," *Biochemistry* 35:648-568 (1996)
- * Blackburn, "E., 1990, JBC., 265, 5919-5921
- * Breaker and Joyce, "Inventing and improving ribozyme function: rational design versus iterative selection methods," *TIBTECH* 12:268-275 (1994)
- * Breaker et al., "A DNA enzyme with Mg²⁺-dependent RNA phosphoesterase activity," *Chemistry & Biology* 2(10):655-660 (1995)
- * Breaker, "Are engineered proteins getting competition from RNA?" *Current Opinion in Biotechnology* 7:442-448 (1996)
- * Burgin et al., "Chemically Modified Hammerhead Ribozymes with Improved Catalytic Rates," *Biochemistry* 35:14090-14097 (1996) (volume no mistakenly listed as 6)
- * Burke et al., "Structural Analysis and Modifications of the Hairpin Ribozyme," *Nucleic Acids and Molecular Biology*, edited by Eckstein and Lilley, Springer-Verlag Berlin Heidelberg, 10:129-143 (1996)
- * Caruthers et al., "Chemical Synthesis of Deoxyoligonucleotides and Deoxyoligonucleotide Analogs," *Methods in Enzymology* 211:3-19 (1992)
- * Cech et al., "Representation of the secondary and tertiary structure of group I introns," *nature structural biology* 1:273-280 (1994)
- * Cech, "Ribozymes and Their Medical Implications," *JAMA* 260:3030-3034 (1988)
- * Chartrand et al., "An oligodeoxyribonucleotide that supports catalytic activity in the hammerhead ribozyme domain," *Nucleic Acids Research* 23(20):4092-4096 (1995)
- * Chen et al., "Multitarget-Ribozyme Directed to Cleave at up to Nine Highly Conserved HIV-1 env RNA Regions Inhibits HIV-1 Replication-Potential Effectiveness Against Most Presently Sequenced HIV-1 Isolates," *Nucleic Acids Research* 20:4581-4589 (1992)
- * Chowrira et al., "In Vitro and in Vivo Comparison of Hammerhead, Hairpin, and Hepatitis Delta Virus Self-Processing Ribozyme Cassettes," *J. Biol. Chem.* 269:25856-25864 (1994)

- * Chowrira et al., "Novel guanosine requirement for catalysis by the hairpin ribozyme," Nature 354:320-322 (1991)
- * Christoffersen and Marr, "Ribozymes as Human Therapeutic Agents," J. Med. Chem. 38:2023-2037 (1995) (also referred to as Christofferson and Marr)
- * Christofferson et al., "Application of computational technologies to ribozyme biotechnology products," Journal of Molecular Structure (Theochem) 311:273-284 (1994) (Christofferson)
- * Collins and Olive, "Reaction Conditions and Kinetics of Self-Cleavage of a Ribozyme Derived From *Neurospora* VS RNA," Biochemistry 32:2795-2799 (1993)
- * Couture and Stinchcomb, "Anti-gene therapy: the use of ribozymes to inhibit gene function," Trends In Genetics 12:510-515 (1996)
- * Daniels et al., "Two Competing Pathways for Self-splicing by Group II Introns: A Quantitative Analysis of *in Vitro* Reaction Rates and Products," J. Mol. Biol. 256:31-49 (1996)
- * Dreyfus, "Restriction Ribozymes?" Einstein Quarterly Journal of Biology and Medicine 6:92-93 (1988)
- * Duval-Valentin, "Specific inhibition of transcription by triple helix-forming oligonucleotides," Proc. Natl. Acad. Sci. USA 89:504-508 (1992)
- * Egholm et al., "PNA hybridizes to complementary oligonucleotides obeying the Watson-Crick hydrogen-bonding rules," Nature 365:566-568 (1993)
- * Elroy-Stein and Moss, "Cytoplasmic Expression System Based on Constitutive Synthesis of Bacteriophage T7 RNA Polymerase in Mammalian Cells," Proc. Natl. Acad. Sci. USA 87:6743-6747 (1990)
- * Feldstein et al., "Two sequences participating in the autolytic processing of satellite tobacco ringspot virus complementary RNA," Gene 82:53-61 (1989)
- * Feng et al., "The RNA Component of Human Telomerase," Science 269:1236-1241 (1995)
- * Forster and Altman, "External Guide Sequences for an RNA Enzyme," Science 249:783-786 (1990)
- * Freier et al., "Improved free-energy parameters for predictions of RNA duplex stability," Proc. Natl. Acad. Sci. USA 83:9373-9377 (1986)

- * Gao and Huang, "Cytoplasmic Expression of a Reporter Gene by Co-Delivery of T7 RNA Polymerase and T7 Promoter Sequence with Cationic Liposomes," Nucleic Acids Research 21:2867-2872 (1993)
- * Good et al., "Expression of small, therapeutic RNAs in human nuclei," Gene Therapy 4:45-54 (1997)
- * Grasby et al., "Purine Functional Groups in Essential Residues of the Hairpin Ribozyme Required for Catalytic Cleavage of RNA," Biochemistry 34:4068-4076 (1995)
- * Griffin et al., "Group II intron ribozymes that cleave DNA and RNA linkages with similar efficiency, and lack contacts with substrate 2'-hydroxyl groups," Chemistry & Biology 2:761-770 (1995)
- * Guerrier-Takada et al., "The RNA Moiety of Ribonuclease P Is the Catalytic Subunit of the Enzyme," Cell 35:849-857 (1983)
- * Guo and Collins, "Efficient *trans*-cleavage of a stem-loop RNA substrate by a ribozyme derived from *Neurospora* VS RNA," EMBO J. 14:368-376 (1995)
- * Hampel and Tritz, "RNA Catalytic Properties of the Minimum (-)sTRSV Sequence," Biochemistry 28:4929-4933 (1989)
- * Hampel et al., "'Hairpin' Catalytic RNA Model: Evidence for Helices and Sequence Requirement for Substrate RNA," Nucleic Acids Research 18:299-304 (1990)
- * Harris et al., "Identification of phosphates involved in catalysis by the ribozyme RNase P RNA," RNA 1:210-218 (1995)
- * Haseloff and Gerlach, "Sequences required for self-catalysed cleavage of the satellite RNA of tobacco ringspot virus," Gene 82:43-52 (1989)
- * Haseloff and Gerlach, "Simple RNA Enzymes with New and Highly Specific Endoribonuclease Activities," Nature 334:585-591 (1988)
- * Hegg et al., "Kinetics and Thermodynamics of Intermolecular Catalysis by Hairpin Ribozymes," Biochemistry 34:15813-15828 (1995)
- * Herschlag and Cech, "Catalysis of RNA Cleavage by the *Tetrahymena thermophila* Ribozyme 1. Kinetic Description of the Reaction of an RNA Substrate Complementary to the Active Site," Biochemistry 29:10159-10171 (1990)
- * Hertel et al., "A Kinetic Thermodynamic Framework for the Hammerhead Ribozyme Reaction," Biochemistry 33:3374-3385 (1994)

- * Hertel et al., "Numbering System for the Hammerhead," Nucleic Acids Research 20:3252 (1992)
- * Ishiwata et al., "Physical-Chemistry Characteristics and Biodistribution of Poly(ethylene glycol)-Coated Liposomes Using Poly(oxyethylene) Cholesteryl Ether," Chem. Pharm. Bull. 43:1005-1011 (1995) (mistakenly referred to as Ishiwataet)
- * Izant and Weintraub, "Constitutive and Conditional Suppression of Exogenous and Endogeneous Genes by Anti-Sense RNA," Science 229:345-352 (1985)
- * Jaeger et al., "Improved Predictions of Secondary Structures for RNA," Proc. Natl. Acad. Sci. USA 86:7706-7710 (1989)
- * Jeffries and Symons, "A Catalytic 13-mer Ribozyme," Nucleic Acids Research 17:1371-1377 (1989) (also referred to as Jefferies)
- * Joseph et al., "Substrate selection rules for the hairpin ribozyme determined by in vitro selection, mutation, and analysis of mismatched substrates," Genes & Development 7:130-138 (1993)
- * Joyce et al., "Amplification, mutation and selection of catalytic RNA," Gene 82:83-87 (1989)
- * Joyce, "Directed Molecular Evolution," Scientific American 267:90-97 (1992)
- * Karpeisky et al, "Highly Efficient Synthesis of 2'-O-Amino Nucleosides And Their Incorporation in Hammerhead Ribozymes," Tetrahedron Letters 39:1131-1134 (1998)
- * Kashani-Sabet et al., "Reversal of the Malignant Phenotype by an Anti-*ras* Ribozyme," Antisense Research & Development 2:3-15 (1992)
- * Kim and Cech, "Three-dimensional model of the active site of the self-splicing rRNA precursor of *Tetrahymena*," Proc. Natl. Acad. Sci. USA 84:8788-8792 (1987)
- * Kim et al., "Specific Association of Human Telomerase Activity with Immortal Cells and Cancer," Science 266:2011-2015 (1994)
- * Knitt et al., "ph Dependencies of the *Tetrahymena* Ribozyme Reveal an Unconventional Origin of an Apparent pK_a ," Biochemistry 35:1560-1570 (1996)
- * Kore, et al., "Sequence specificity of the hammerhead ribozyme revisited; the NIH rule", Nucleic Acids Research, 26(18):4116-4120 (1998).
- * Kumar and Ellington, "Artificial evolution and natural ribozymes," FASEB J. 9:1183-1195 (1995)

- * Lasic and Needham "The 'Stealth' Liposome: A Prototypical Biomaterial," Chemical Reviews 95:2601-2627 (1995)
- * Lasic and Papahadjopoulos, "Liposomes Revisited," Science 267:1275-1276 (1995)
- * L'Huillier et al., "Cytoplasmic Delivery of Ribozymes Leads to Efficient Reduction in α -Lactalbumin mRNA Levels in C1271 Mouse," EMBO J. 11:4411-4418 (1992)
- * Li and Altman, "Cleavage by RNase P of gene N mRNA reduces bacteriophage λ burst size," Nucleic Acids Research 24:835-842 (1996)
- * Li et al., "Thermodynamic and Activation Parameters for Binding of a Pyrene-Labeled Substrate by the *Tetrahymena* Ribozyme: Docking is Not Diffusion-Controlled and is Driven by a Favorable Entropy Change," Biochemistry 34:14394-14399 (1995)
- * Lieber et al., "Stable High-Level Gene Expression in Mammalian Cells by T7 Phage RNA Polymerase," Methods Enzymol. 217:47-66 (1993)
- * Limbach et al., "Summary: the modified nucleosides of RNA," Nucleic Acids Research 22(12):2183-2196 (1994)
- * Lisacek et al., "Automatic Identification of Group I Intron Cores in Genomic DNA Sequences," J. Mol. Biol. 235:1206-1217 (1994)
- * Lisiewicz et al., "Inhibition of Human Immunodeficiency Virus Type 1 Replication by Regulated Expression of a Polymeric Tat Activation Response RNA Decoy as a Strategy for Gene Therapy in AIDS," Proc. Natl. Acad. Sci. U.S.A. 90:8000-8004 (1993)
- * Liu et al., "Cationic Liposome-mediated Intravenous Gene Delivery," J. Biol. Chem. 270(42):24864-24870 (1995)
- * McGarry and Lindquist, "Inhibition of heat shock protein synthesis by heat-inducible antisense RNA," Proc. Natl. Acad. Sci. USA 83:399-403 (1986)
- * McKay, "Structure and function of the hammerhead ribozyme: an unfinished story," RNA 2:395-403 (1996)
- * Michel and Westhof, "Slippery substrates," Nat. Struct. Biol. 1:5-7 (1994)
- * Michel et al., "Structure and Activities of Group II Introns," Annu. Rev. Biochem. 64:435-461 (1995)
- * Michels and Pyle, "Conversion of a Group II Intron into a New Multiple-Turnover Ribozyme that Selectively Cleaves Oligonucleotides: Elucidation of Reaction Mechanism and Structure/Function Relationships," Biochemistry 34:2965-2977 (1995)

- * Milligan and Uhlenbeck, "Synthesis of Small RNAs Using T7 RNA Polymerase," Methods Enzymol. 180:51-62 (1989)
- * Mitra et al., "A mammalian 2-5A system functions as an antiviral pathway in transgenic plants," Proc. Natl. Acad. Sci. USA 93:6780-6785 (1996)
- * Mohr et al., "A tyrosyl-tRNA synthetase can function similarly to an RNA structure in the *Tetrahymena* ribozyme," Nature 370:147-150 (1994)
- * Moore and Sharp, "Site-Specific Modification of Pre-mRNA: The 2'-Hydroxyl Groups at the Splice Sites," Science 256:992-996 (1992)
- * Mukhopadhyay et al., "Antisense Regulation of Oncogenes in Human Cancer," Critical Reviews in Oncogenesis 7:151-190 (1996)
- * Nathans and Smith, "Restriction Endonucleases in the Analysis and Restructuring of DNA Molecules," Ann. Rev. Biochem. 44:273-293 (1975)
- * Ohkawa et al., "Activities of HIV-RNA Targeted Ribozymes Transcribed From a 'Shot-Gun' Type Ribozyme-trimming Plasmid," Nucleic Acids Symp. Ser. 27:15-16 (1992)
- * Ojwang et al., "Inhibition of Human Immunodeficiency Virus Type 1 Expression by a Hairpin Ribozyme," Proc. Natl. Acad. Sci. USA 89:10802-10806 (1992)
- * Oku et al., "Real-time analysis of liposomal trafficking in tumor-bearing mice by use of positron emission tomography," Biochimica et Biophysica Acta 1238:86-90 (1995)
- * Orgel, "Selection *in vitro*," Proc. R. Soc. London B. 205:435-442 (1979)
- * Pace and Smith, "Ribonuclease P: Function and Variation," J. Biol. Chem. 265:3587-3590 (1990)
- * Pan et al., "Probing of tertiary interactions in RNA: 2'-Hydroxyl-base contacts between the Rnase P and pre-tRNA," Proc. Natl. Acad. Sci. USA 92:12510-12514 (1995)
- * Perreault et al., "Mixed Deoxyribo- and Ribo-Oligonucleotides with Catalytic Activity," Nature 344:565-567 (1990) (often mistakenly listed as Perrault)
- * Perrotta and Been, "A pseudoknot-like structure required for efficient self-cleavage of hepatitis delta virus RNA," Nature 350:434-436 (1991)
- * Perrotta and Been, "Cleavage of Oligoribonucleotides by a Ribozyme Derived from the Hepatitis δ Virus RNA Sequence," Biochemistry 31:16-21 (1992)
- * Pieken et al., "Kinetic Characterization of Ribonuclease-Resistant 2'-Modified Hammerhead Ribozymes," Science 253:314-317 (1991)

- * Puttaraju et al., "A circular trans-acting hepatitis delta virus ribozyme," Nucleic Acids Research 21:4253-4258 (1993)
- * Pyle et al., "Building a Kinetic Framework for Group II Intron Ribozyme Activity: Quantitation of Interdomain Binding and Reaction Rate," Biochemistry 33:2716-2725 (1994)
- * Robertson et al., "Purification and Properties of a Specific *Escherichia coli* Ribonuclease which Cleaves a Tyrosine Transfer Ribonucleic Acid Precursor," J. Biol. Chem. 247:5243-5251 (1972)
- * Rossi et al., "Ribozymes as Anti-HIV-1 Therapeutic Agents: Principles, Applications, and Problems," Aids Research and Human Retroviruses 8:183-189 (1992)
- * Santoro and Joyce, "A general purpose RNA-cleaving DNA enzyme," Proc. Natl. Acad. Sci. USA 94:4262-4266 (1997)
- * Sarver et al., "Ribozymes as Potential Anti-HIV-1 Therapeutic Agents" Science 247:1222-1225 (1990)
- * Saville and Collins, "A Site-Specific Self-Cleavage Reaction Performed by a Novel RNA In *Neurospora* Mitochondria," Cell 61:685-696 (1990)
- * Saville and Collins, "RNA-Mediated Ligation of Self-Cleavage Products of a *Neurospora* Mitochondrial Plasmid Transcript," Proc. Natl. Acad. Sci. USA 88:8826-8830 (1991)
- * Scanlon et al., "Ribozyme-Mediated Cleavage of c-fos mRNA Reduces Gene Expression of DNA Synthesis Enzymes and Metallothionein," Proc. Natl. Acad. Sci. USA 88:10591-10595 (1991)
- * Scaringe et al., "Chemical synthesis of biologically active oligoribonucleotides using β -cyanoethyl protected ribonucleoside phosphoramidites," Nucl Acids Res. 18:5433-5441 (1990)
- * Schmidt et al., "Base and sugar requirements for RNA cleavage of essential nucleoside residues in internal loop B of the hairpin ribozyme: implications for secondary structure," Nucleic Acids Research 24:573-581 (1996)
- * Scott et al., "The crystal structure of an All-RNA hammerhead ribozyme: A proposed mechanism for RNA catalytic cleavage," Cell 81:991-1002 (1995)
- * Shabarova et al., "Chemical ligation of DNA: The first non-enzymatic assembly of a biologically active gene," Nucleic Acids Research 19:4247-4251 (1991)
- * Stein and Cheng, "Antisense Oligonucleotides as Therapeutic Agents - Is the Bullet Really Magical?" Science 261:1004-1288 (1993)

- * Strobel et al., "Exocyclic Amine of the Conserved G·U Pair at the Cleavage Site of the *Tetrahymena* Ribozyme Contributes to 5'-Splice Site Selection and Transition State Stabilization," Biochemistry 35:1201-1211 (1996)
- * Strobel et al., "Minor Groove Recognition of the Conserved G·U Pair at the *Tetrahymena* Ribozyme Reaction Site," Science 267:675-679 (1995)
- * Sullenger and Cech, "Ribozyme-mediated repair of defective mRNA by targeted trans-splicing," Nature 371:619-622 (1994)
- * Sullenger and Cech, "Tethering Ribozymes to a Retroviral Packaging Signal for Destruction of Viral RNA," Science 262:1566-1569 (1993)
- * Szostak, "In Vitro Genetics," TIBS 17:89-93 (1993)
- * Taira et al., "Construction of a novel RNA-transcript-trimming plasmid which can be used both *in vitro* in place of run-off and (G)-free transcriptions and *in vivo* as multi-sequences transcription vectors," Nucleic Acids Research 19:5125-5130 (1991)
- * Tang and Breaker, "Examination of the catalytic fitness of the hammerhead ribozyme by *in vitro* selection," RNA 3:914-925 (1997)
- * Thompson et al., "Improved accumulation and activity of ribozymes expressed from a tRNA-based RNA polymerase III promoter," Nucleic Acids Research 23:2259-2268 (1995)
- * Torrence et al., "Targeting RNA for degradation with a (2'-5') oligoadenylate-antisense chimera," Proc. Natl. Acad. Sci. USA 90:1300-1304 (1993)
- * Turner et al., "Improved Parameters for Prediction of RNA Structure," Cold Spring Harbor Symposia on Quantitative Biology Volume LII, pp. 123-133 (1987)
- * Turner et al., "Free Energy Increments for Hydrogen Bonds in Nucleic Acid Base Pairs," J. Am. Chem. Soc. 109:3783-3785 (1987)
- * Uhlenbeck, "A Small Catalytic Oligoribonucleotide," Nature 328:596-600 (1987) (this is listed as Nature 327 in the various specifications, but it is actually 328)
- * Usman and Cedergren, "Exploiting the chemical synthesis of RNA," TIBS 17:334-339 (1992)
- * Usman and McSwiggen, "Ch. 30 - Catalytic RNA (Ribozymes) as Drugs," Annual Reports in Medicinal Chemistry 30:285-294 (1995)

- * Usman et al., "Automated Chemical Synthesis of Long Oligoribonucleotides Using 2'-O-Silylated Ribonucleoside 3'-O-Phosphoramidites on a Controlled-Pore Glass Support: Synthesis of a 43-Nucleotide Sequence Similar to the 3'-Half Molecule of an *Escherichia coli* Formylmethoionine tRNA," J. Am. Chem. Soc. 109:7845-7854 (1987)
- * Usman et al., "Chemical modification of hammerhead ribozymes: activity and nuclease resistance," Nucleic Acids Symposium Series 31:163-164 (1994)
- * Usman et al., "Hammerhead ribozyme engineering," Current Opinion in Structural Biology 1:527-533(1996)
- * Vaish et al., "Isolation of Hammerhead Ribozymes with Altered Core Sequences by *in Vitro* Selection," Biochemistry 36:6495-6501 (1997)
- * Ventura et al., "Activation of HIV-Specific Ribozyme Activity by Self-Cleavage," Nucleic Acids Research 21:3249-3255 (1993)
- * Weerasinghe et al., "Resistance to Human Immunodeficiency Virus Type 1 (HIV-1) Infection in Human CD4⁺ Lymphocyte-Derived Cell Lines Conferred by Using Retroviral Vectors Expressing an HIV-1 RNA-Specific Ribozyme," Journal of Virology 65:5531-5534 (1994)
- * Wincott et al., "Synthesis, deprotection, analysis and purification of RNA and ribozymes," Nucleic Acids Research 23(14):2677-2684 (1995)
- * Wincott et al., "A Practical Method for the Production of RNA and Ribozymes," Methods in Molecular Biology 74:59-69 (1997)
- * Wu-Pong, "Oligonucleotides: Opportunities for Drug Therapy and Research," BioPharm pp20-33 (1994)
- * Yu et al., "A Hairpin Ribozyme Inhibits Expression of Diverse Strains of Human Immunodeficiency Virus Type 1," Proc. Natl. Acad. Sci. USA 90:6340-6344 (1993)
- * Yuan et al., "Targeted cleavage of mRNA by human RNase P," Proc. Natl. Acad. Sci. USA 89:8006-8010 (1992)
- * Zarrinkar and Williamson, "The P9.1-P9.2 peripheral extension helps guide folding of the *Tetrahymena* ribozyme," Nucleic Acids Research 24:854-858 (1996)
- * Zaug et al., "The *Tetrahymena* Ribozyme Acts Like an RNA Restriction Endonuclease," Nature 324:429-433 (1986)
- * Zhou et al., "Synthesis of Functional mRNA in Mammalian Cells by Bacteriophage T3 RNA Polymerase," Mol. Cell. Biol. 10:4529-4537 (1990)

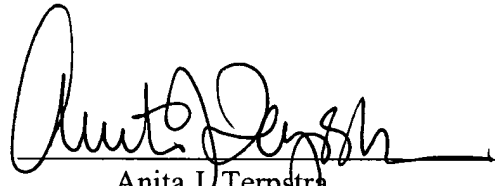
- * Zimmerly et al., "A Group II Intron RNA is a Catalytic Component of a DNA Endonuclease Involved in Intron Mobility," Cell 83:529-538 (1995)

In accordance with MPEP Sections 609 and 707.05(b), it is requested the document cited (including any cited in applicant's specification which is not repeated on the attached Form PTO-1449) be given thorough consideration and that it be cited of record in the prosecution history of the present application by initialing on Form PTO-1449. Such initialing is requested even if the Examiner does not consider a cited document to be sufficiently pertinent to use in a rejection, or otherwise does not consider it to be prior art for any reason, or even if the Examiner does not believe that the guidelines for citation have been fully complied with. This is requested so that each document becomes listed on the face of the patent issuing on the present application.

Respectfully submitted,
McDonnell Boehnen Hulbert & Berghoff

Date: November 13, 2003

By:


Anita J. Terpstra
Registration No. 47,132

FORM PTO-1449
(Rev. 2-32)

U.S. Department of Commerce
Patent and Trademark Office

Atty. Docket No.

MBHB00-882-I
(400/118)

Serial No.

TBA

**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**

(Use several sheets if necessary)

Applicant:

McSwiggen, et al.

Filing Date:

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FOREIGN PATENT DOCUMENTS

		Document Number	Date	Country	Class	Subclass	Translation
	*	EP 0 360 257	09/20/89	EP (Hampel et al.)			
	*	WO 91/03162	03/21/91	WO (Rossi et al.)			
	*	WO 92/07065	04/30/92	WO (Eckstein et al.)			
	*	WO 93/15187	08/05/93	WO (Usman et al.)			
	*	WO 93/23057	11/25/93	WO (Thompson, et al.)			
	*	WO 93/23569	11/25/93	WO (Draper et al.)			
	*	WO 94/02595	02/03/94	WO (Sullivan et al.)			
	*	WO 95/04818	02/16/95	WO (Draper et al.)			
	*	WO 95/11304	04/27/95	WO (Usman et al.)			
	*	WO 95/13380	05/18/95	WO (Draper et al.)			
	*	WO 95/23225	08/31/95	WO (Stinchcomb et al.)			
	*	WO 96/10390	04/11/96	WO (Ansell, et al.)			
	*	WO 96/10391	04/11/96	WO (Choi et al.)			
	*	WO 96/10392	04/11/96	WO (Holland et al.)			
	*	WO 96/18736	06/20/96	WO (Beigelman)			
	*	WO 96/19577	06/27/96	WO (Collins)			
	*	WO 96/22689	08/01/96	WO (Pyle et al.)			
	*	WO 97/26270	07/24/97	WO (Wincott et al.)			
	*	WO 98/01542	01/15/98	WO (Collins et al.)			
	*	WO 98/13526	04/02/98	WO (Woolf et al.)			
	*	WO 98/14592	04/09/98	WO (Cech et al.)			
	*	WO 98/14593	04/09/98	WO (Cech et al.)			
	*	WO 98/28317	07/02/98	WO (Karpiesky et al.)			
	*	WO 98/43993	10/08/98	WO (Breaker et al.)			
	*	WO 98/58058	12/23/98	WO (Ludwig et al.)			
	*	WO 99/16871	04/08/99	WO (Eckstein et al.)			
	*	WO 99/55857	11/04/99	WO (Beigelman et al.)			

EXAMINER

DATE CONSIDERED

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FORM PTO-1449 (Rev. 2-32)	U.S. Department of Commerce Patent and Trademark Office	Atty. Docket No. MBHB00-882-I (400/118)	Serial No. TBA
INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Use several sheets if necessary)		Applicant: McSwiggen, et al.	
		Filing Date: TBA	Group: TBA

OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc).

*	Abramovitz et al., "Catalytic Role of 2'-Hydroxyl Groups Within a Group II Intron Active Site," <u>Science</u> 271:1410-1413 (1996)
*	Akhtar and Juliano, "Cellular Uptake and Intracellular Fate of AntiSense Oligonucleotides," <u>Trends Cell Biol.</u> 2:139-144 (1992)
*	Banerjee and Turner, "The Time Dependence of Chemical Modification Reveals Slow Steps in the Folding of a Group I Ribozyme," <u>Biochemistry</u> 34:6504-6512 (1995)
*	Beaudry and Joyce, "Directed Evolution of an RNA Enzyme," <u>Science</u> 257:635-641 (1992)
*	Beigelman et al., "Chemical Modification of Hammerhead Ribozymes," <u>J. Biol. Chem.</u> 270:25702-25708 (1995)
*	Bellon et al., "Amino-Linked Ribozymes: Post-Synthetic Conjugation of Half-Ribozymes," <u>Nucleosides & Nucleotides</u> 16:951-954 (1997)
*	Berzal-Herranz et al., "Essential nucleotide sequences and secondary structure elements of the hairpin ribozyme," <u>EBMO J.</u> 12:2567-2574 (1993)
*	Berzal-Herranz et al., "In vitro selection of active hairpin ribozymes by sequential RNA-catalyzed cleavage and ligation reactions," <u>Genes & Development</u> 6:129-134 (1992)
*	Bevilacqua et al., "A Mechanistic Framework for the Second Step of Splicing Catalyzed by the <i>Tetrahymena</i> Ribozyme," <u>Biochemistry</u> 35:648-658 (1996)
*	Blackburn, "E., 1990, <u>JBC.</u> , 265, 5919-5921
*	Breaker and Joyce, "Inventing and improving ribozyme function: rational design versus iterative selection methods," <u>TIBTECH</u> 12:268-275 (1994)
*	Breaker et al., "A DNA enzyme with Mg ²⁺ -dependent RNA phosphoesterase activity," <u>Chemistry & Biology</u> 2(10):655-660 (1995)
*	Breaker, "Are engineered proteins getting competition from RNA?" <u>Current Opinion in Biotechnology</u> 7:442-448 (1996)
*	Burgin et al., "Chemically Modified Hammerhead Ribozymes with Improved Catalytic Rates," <u>Biochemistry</u> 35:14090-14097 (1996) (volume no mistakenly listed as 6)

EXAMINER	DATE CONSIDERED
----------	-----------------

EXAMINER: Initial if citation considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication.

FORM PTO-1449
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U.S. Department of Commerce
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Serial No.

MBHB00-882-I
(400/118)

TBA

**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**

(Use several sheets if necessary)

Applicant:

McSwiggen, et al.

Filing Date:

TBA

Group:

TBA

*	Burke et al., "Structural Analysis and Modifications of the Hairpin Ribozyme," <u>Nucleic Acids and Molecular Biology</u> , edited by Eckstein and Lilley, Springer-Verlag Berlin Heidelberg, 10:129-143 (1996)
*	Caruthers et al., "Chemical Synthesis of Deoxyoligonucleotides and Deoxyoligonucleotide Analogs," <u>Methods in Enzymology</u> 211:3-19 (1992)
*	Cech et al., "Representation of the secondary and tertiary structure of group I introns," <u>nature structural biology</u> 1:273-280 (1994)
*	Cech, "Ribozymes and Their Medical Implications," <u>JAMA</u> 260:3030-3034 (1988)
*	Chartrand et al., "An oligodeoxyribonucleotide that supports catalytic activity in the hammerhead ribozyme domain," <u>Nucleic Acids Research</u> 23(20):4092-4096 (1995)
*	Chen et al., "Multitarget-Ribozyme Directed to Cleave at up to Nine Highly Conserved HIV-1 env RNA Regions Inhibits HIV-1 Replication-Potential Effectiveness Against Most Presently Sequenced HIV-1 Isolates," <u>Nucleic Acids Research</u> 20:4581-4589 (1992)
*	Chowrira et al., " <i>In Vitro</i> and <i>in Vivo</i> Comparison of Hammerhead, Hairpin, and Hepatitis Delta Virus Self-Processing Ribozyme Cassettes," <u>J. Biol. Chem.</u> 269:25856-25864 (1994)
*	Chowrira et al., "Novel guanosine requirement for catalysis by the hairpin ribozyme," <u>Nature</u> 354:320-322 (1991)
*	Christoffersen and Marr, "Ribozymes as Human Therapeutic Agents," <u>J. Med. Chem.</u> 38:2023-2037 (1995) (also referred to as Christofferson and Marr)
*	Christofferson et al., "Application of computational technologies to ribozyme biotechnology products," <u>Journal of Molecular Structure (Theochem)</u> 311:273-284 (1994) (Christoffersen)
*	Collins and Olive, "Reaction Conditions and Kinetics of Self-Cleavage of a Ribozyme Derived From <i>Neurospora</i> VS RNA," <u>Biochemistry</u> 32:2795-2799 (1993)
*	Couture and Stinchcomb, "Anti-gene therapy: the use of ribozymes to inhibit gene function," <u>Trends In Genetics</u> 12:510-515 (1996)

EXAMINER

DATE CONSIDERED

EXAMINER: Initial if citation considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication.

FORM PTO-1449
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Serial No.

MBHB00-882-I
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**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**

(Use several sheets if necessary)

Applicant:

McSwiggen, et al.

Filing Date:

TBA

Group:

TBA

	*	Daniels et al., "Two Competing Pathways for Self-splicing by Group II Introns: A Quantitative Analysis of <i>in Vitro</i> Reaction Rates and Products," <u>J. Mol. Biol.</u> 256:31-49 (1996)
	*	Dreyfus, "Restriction Ribozymes?" <u>Einstein Quarterly Journal of Biology and Medicine</u> 6:92-93 (1988)
	*	Duval-Valentin, "Specific inhibition of transcription by triple helix-forming oligonucleotides," <u>Proc. Natl. Acad. Sci. USA</u> 89:504-508 (1992)
	*	Egholm et al., "PNA hybridizes to complementary oligonucleotides obeying the Watson-Crick hydrogen-bonding rules," <u>Nature</u> 365:566-568 (1993)
	*	Elroy-Stein and Moss, "Cytoplasmic Expression System Based on Constitutive Synthesis of Bacteriophage T7 RNA Polymerase in Mammalian Cells," <u>Proc. Natl. Acad. Sci. USA</u> 87:6743-6747 (1990)
	*	Feldstein et al., "Two sequences participating in the autolytic processing of satellite tobacco ringspot virus complementary RNA," <u>Gene</u> 82:53-61 (1989)
	*	Feng et al., "The RNA Component of Human Telomerase," <u>Science</u> 269:1236-1241 (1995)
	*	Forster and Altman, "External Guide Sequences for an RNA Enzyme," <u>Science</u> 249:783-786 (1990)
	*	Freier et al., "Improved free-energy parameters for predictions of RNA duplex stability," <u>Proc. Natl. Acad. Sci. USA</u> 83:9373-9377 (1986)
	*	Gao and Huang, "Cytoplasmic Expression of a Reporter Gene by Co-Delivery of T7 RNA Polymerase and T7 Promoter Sequence with Cationic Liposomes," <u>Nucleic Acids Research</u> 21:2867-2872 (1993)
	*	Good et al., "Expression of small, therapeutic RNAs in human nuclei," <u>Gene Therapy</u> 4:45-54 (1997)
	*	Grasby et al., "Purine Functional Groups in Essential Residues of the Hairpin Ribozyme Required for Catalytic Cleavage of RNA," <u>Biochemistry</u> 34:4068-4076 (1995)

EXAMINER

DATE CONSIDERED

EXAMINER: Initial if citation considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication.

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**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**

(Use several sheets if necessary)

Applicant:

McSwiggen, et al.

Filing Date:

TBA

Group:

TBA

	*	Griffin et al., "Group II intron ribozymes that cleave DNA and RNA linkages with similar efficiency, and lack contacts with substrate 2'-hydroxyl groups," <u>Chemistry & Biology</u> 2:761-770 (1995)
	*	Guerrier-Takada et al., "The RNA Moiety of Ribonuclease P Is the Catalytic Subunit of the Enzyme," <u>Cell</u> 35:849-857 (1983)
	*	Guo and Collins, "Efficient <i>trans</i> -cleavage of a stem-loop RNA substrate by a ribozyme derived from <i>Neurospora</i> VS RNA," <u>EMBO J.</u> 14:368-376 (1995)
	*	Hampel and Tritz, "RNA Catalytic Properties of the Minimum (-)sTRSV Sequence," <u>Biochemistry</u> 28:4929-4933 (1989)
	*	Hampel et al., "'Hairpin' Catalytic RNA Model: Evidence for Helices and Sequence Requirement for Substrate RNA," <u>Nucleic Acids Research</u> 18:299-304 (1990)
	*	Harris et al., "Identification of phosphates involved in catalysis by the ribozyme RNase P RNA," <u>RNA</u> 1:210-218 (1995)
	*	Haseloff and Gerlach, "Sequences required for self-catalysed cleavage of the satellite RNA of tobacco ringspot virus," <u>Gene</u> 82:43-52 (1989)
	*	Haseloff and Gerlach, "Simple RNA Enzymes with New and Highly Specific Endoribonuclease Activities," <u>Nature</u> 334:585-591 (1988)
	*	Hegg et al., "Kinetics and Thermodynamics of Intermolecular Catalysis by Hairpin Ribozymes," <u>Biochemistry</u> 34:15813-15828 (1995)
	*	Herschlag and Cech, "Catalysis of RNA Cleavage by the <i>Tetrahymena thermophila</i> Ribozyme 1. Kinetic Description of the Reaction of an RNA Substrate Complementary to the Active Site," <u>Biochemistry</u> 29:10159-10171 (1990)
	*	Hertel et al., "A Kinetic Thermodynamic Framework for the Hammerhead Ribozyme Reaction," <u>Biochemistry</u> 33:3374-3385 (1994)
	*	Hertel et al., "Numbering System for the Hammerhead," <u>Nucleic Acids Research</u> 20:3252 (1992)

EXAMINER

DATE CONSIDERED

EXAMINER: Initial if citation considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication.

FORM PTO-1449 (Rev. 2-32)	U.S. Department of Commerce Patent and Trad mark Office	Atty. Docket No. MBHB00-882-I (400/118)	Serial No. TBA
INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Use several sheets if necessary)		Applicant: McSwiggen, et al.	
		Filing Date: TBA	Group: TBA

	*	Ishiwata et al., "Physical-Chemistry Characteristics and Biodistribution of Poly(ethylene glycol)-Coated Liposomes Using Poly(oxyethylene) Cholesteryl Ether," <u>Chem. Pharm. Bull.</u> 43:1005-1011 (1995) (mistakenly referred to as Ishiwataet)
	*	Izant and Weintraub, "Constitutive and Conditional Suppression of Exogenous and Endogeneous Genes by Anti-Sense RNA," <u>Science</u> 229:345-352 (1985)
	*	Jaeger et al., "Improved Predictions of Secondary Structures for RNA," <u>Proc. Natl. Acad. Sci. USA</u> 86:7706-7710 (1989)
	*	Jeffries and Symons, "A Catalytic 13-mer Ribozyme," <u>Nucleic Acids Research</u> 17:1371-1377 (1989) (also referred to as Jefferies)
	*	Joseph et al., "Substrate selection rules for the hairpin ribozyme determined by in vitro selection, mutation, and analysis of mismatched substrates," <u>Genes & Development</u> 7:130-138 (1993)
	*	Joyce et al., "Amplification, mutation and selection of catalytic RNA," <u>Gene</u> 82:83-87 (1989)
	*	Joyce, "Directed Molecular Evolution," <u>Scientific American</u> 267:90-97 (1992)
	*	Karpeisky et al, "Highly Efficient Synthesis of 2'-O-Amino Nucleosides And Their Incorporation in Hammerhead Ribozymes," <u>Tetrahedron Letters</u> 39:1131-1134 (1998)
	*	Kashani-Sabet et al., "Reversal of the Malignant Phenotype by an Anti-ras Ribozyme," <u>Antisense Research & Development</u> 2:3-15 (1992)
	*	Kim and Cech, "Three-dimensional model of the active site of the self-splicing rRNA precursor of <i>Tetrahymena</i> ," <u>Proc. Natl. Acad. Sci. USA</u> 84:8788-8792 (1987)
	*	Kim et al., "Specific Association of Human Telomerase Activity with Immortal Cells and Cancer," <u>Science</u> 266:2011-2015 (1994)
	*	Knitt et al., "ph Dependencies of the <i>Tetrahymena</i> Ribozyme Reveal an Unconventional Origin of an Apparent pK _a ," <u>Biochemistry</u> 35:1560-1570 (1996)
	*	Kore, et al., "Sequence specificity of the hammerhead ribozyme revisited; the NIH rule", <u>Nucleic Acids Research</u> , 26(18):4116-4120 (1998).

EXAMINER	DATE CONSIDERED
----------	-----------------

EXAMINER: Initial if citation considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication.

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MBHB00-882-I
(400/118)

Serial No.

TBA

Applicant:

McSwiggen, et al.

Filing Date:

TBA

Group:

TBA

	*	Kumar and Ellington, "Artificial evolution and natural ribozymes," <u>FASEB J.</u> 9:1183-1195 (1995)
	*	Lasic and Needham "The 'Stealth' Liposome: A Prototypical Biomaterial," <u>Chemical Reviews</u> 95:2601-2627 (1995)
	*	Lasic and Papahadjopoulos, "Liposomes Revisited," <u>Science</u> 267:1275-1276 (1995)
	*	L'Huillier et al., "Cytoplasmic Delivery of Ribozymes Leads to Efficient Reduction in α -Lactalbumin mRNA Levels in C1271 Mouse," <u>EMBO J.</u> 11:4411-4418 (1992)
	*	Li and Altman, "Cleavage by RNase P of gene N mRNA reduces bacteriophage λ burst size," <u>Nucleic Acids Research</u> 24:835-842 (1996)
	*	Li et al., "Thermodynamic and Activation Parameters for Binding of a Pyrene-Labeled Substrate by the <i>Tetrahymena</i> Ribozyme: Docking is Not Diffusion-Controlled and is Driven by a Favorable Entropy Change," <u>Biochemistry</u> 34:14394-14399 (1995)
	*	Lieber et al., "Stable High-Level Gene Expression in Mammalian Cells by T7 Phage RNA Polymerase," <u>Methods Enzymol.</u> 217:47-66 (1993)
	*	Limbach et al., "Summary: the modified nucleosides of RNA," <u>Nucleic Acids Research</u> 22(12):2183-2196 (1994)
	*	Lisacek et al., "Automatic Identification of Group I Intron Cores in Genomic DNA Sequences," <u>J. Mol. Biol.</u> 235:1206-1217 (1994)
	*	Liszewicz et al., "Inhibition of Human Immunodeficiency Virus Type 1 Replication by Regulated Expression of a Polymeric Tat Activation Response RNA Decoy as a Strategy for Gene Therapy in AIDS," <u>Proc. Natl. Acad. Sci. U.S.A.</u> 90:8000-8004 (1993)
	*	Liu et al., "Cationic Liposome-mediated Intravenous Gene Delivery," <u>J. Biol. Chem.</u> 270(42):24864-24870 (1995)
	*	McGarry and Lindquist, "Inhibition of heat shock protein synthesis by heat-inducible antisense RNA," <u>Proc. Natl. Acad. Sci. USA</u> 83:399-403 (1986)
	*	McKay, "Structure and function of the hammerhead ribozyme: an unfinished story," <u>RNA</u> 2:395-403 (1996)

EXAMINER

DATE CONSIDERED

EXAMINER: Initial if citation considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication.

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TBA

**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**

(Use several sheets if necessary)

Applicant:

McSwiggen, et al.

Filing Date:

TBA

Group:

TBA

*	Michel and Westhof, "Slippery substrates," <u>Nat. Struct. Biol.</u> 1:5-7 (1994)
*	Michel et al., "Structure and Activities of Group II Introns," <u>Annu. Rev. Biochem.</u> 64:435-461 (1995)
*	Michels and Pyle, "Conversion of a Group II Intron into a New Multiple-Turnover Ribozyme that Selectively Cleaves Oligonucleotides: Elucidation of Reaction Mechanism and Structure/Function Relationships," <u>Biochemistry</u> 34:2965-2977 (1995)
*	Milligan and Uhlenbeck, "Synthesis of Small RNAs Using T7 RNA Polymerase," <u>Methods Enzymol.</u> 180:51-62 (1989)
*	Mitra et al., "A mammalian 2-5A system functions as an antiviral pathway in transgenic plants," <u>Proc. Natl. Acad. Sci. USA</u> 93:6780-6785 (1996)
*	Mohr et al., "A tyrosyl-tRNA synthetase can function similarly to an RNA structure in the <i>Tetrahymena</i> ribozyme," <u>Nature</u> 370:147-150 (1994)
*	Moore and Sharp, "Site-Specific Modification of Pre-mRNA: The 2'-Hydroxyl Groups at the Splice Sites," <u>Science</u> 256:992-996 (1992)
*	Mukhopadhyay et al., "Antisense Regulation of Oncogenes in Human Cancer," <u>Critical Reviews in Oncogenesis</u> 7:151-190 (1996)
*	Nathans and Smith, "Restriction Endonucleases in the Analysis and Restructuring of DNA Molecules," <u>Ann. Rev. Biochem.</u> 44:273-293 (1975)
*	Ohkawa et al., "Activities of HIV-RNA Targeted Ribozymes Transcribed From a 'Shot-Gun' Type Ribozyme-trimming Plasmid," <u>Nucleic Acids Symp. Ser.</u> 27:15-16 (1992)
*	Ojwang et al., "Inhibition of Human Immunodeficiency Virus Type 1 Expression by a Hairpin Ribozyme," <u>Proc. Natl. Acad. Sci. USA</u> 89:10802-10806 (1992)
*	Oku et al., "Real-time analysis of liposomal trafficking in tumor-bearing mice by use of positron emission tomography," <u>Biochimica et Biophysica Acta</u> 1238:86-90 (1995)
*	Orgel, "Selection <i>in vitro</i> ," <u>Proc. R. Soc. London B.</u> 205:435-442 (1979)
*	Pace and Smith, "Ribonuclease P: Function and Variation," <u>J. Biol. Chem.</u> 265:3587-3590 (1990)

EXAMINER

DATE CONSIDERED

EXAMINER: Initial if citation considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication.

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S rial No.

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TBA

**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**

(Use several sheets if necessary)

Applicant:
McSwiggen, et al.

Filing Date:
TBA

Group:
TBA

	*	Pan et al., "Probing of tertiary interactions in RNA: 2'-Hydroxyl-base contacts between the Rnase P and pre-tRNA," <u>Proc. Natl. Acad. Sci. USA</u> 92:12510-12514 (1995)
	*	Perreault et al., "Mixed Deoxyribo- and Ribo-Oligonucleotides with Catalytic Activity," <u>Nature</u> 344:565-567 (1990) (often mistakenly listed as Perrault)
	*	Perrotta and Been, "A pseudoknot-like structure required for efficeint self-cleavage of hepatitis delta virus RNA," <u>Nature</u> 350:434-436 (1991)
	*	Perrotta and Been, "Cleavage of Oligoribonucleotides by a Ribozyme Derived from the Hepatitis δ Virus RNA Sequence," <u>Biochemistry</u> 31:16-21 (1992)
	*	Pieken et al., "Kinetic Characterization of Ribonuclease-Resistant 2'-Modified Hammerhead Ribozymes," <u>Science</u> 253:314-317 (1991)
	*	Puttaraju et al., "A circular trans-acting hepatitis delta virus ribozyme," <u>Nucleic Acids Research</u> 21:4253-4258 (1993)
	*	Pyle et al., "Building a Kinetic Framework for Group II Intron Ribozyme Activity: Quantitation of Interdomain Binding and Reaction Rate," <u>Biochemistry</u> 33:2716-2725 (1994)
	*	Robertson et al., "Purification and Properties of a Specific <i>Escherichia coli</i> Riobnuclease which Cleaves a Tyrosine Transfer Ribonucleic Acid Precursor," <u>J. Biol. Chem.</u> 247:5243-5251 (1972)
	*	Rossi et al., "Ribozymes as Anti-HIV-1 Therapeutic Agents: Principles, Applications, and Problems," <u>Aids Research and Human Retroviruses</u> 8:183-189 (1992)
	*	Santoro and Joyce, "A general purpose RNA-cleaving DNA enzyme," <u>Proc. Natl. Acad. Sci. USA</u> 94:4262-4266 (1997)
	*	Sarver et al., "Ribozymes as Potential Anti-HIV-1 Therapeutic Agents" <u>Science</u> 247:1222-1225 (1990)
	*	Saville and Collins, "A Site-Specific Self-Cleavage Reaction Performed by a Novel RNA In Neurospora Mitochondria," <u>Cell</u> 61:685-696 (1990)

EXAMINER

DATE CONSIDERED

EXAMINER: Initial if citation considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication.

FORM PTO-1449
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**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**

(Use several sheets if necessary)

Applicant:
McSwiggen, et al.

Filing Date:
TBA

Group:
TBA

	*	Saville and Collins, "RNA-Mediated Ligation of Self-Cleavage Products of a <i>Neurospora</i> Mitochondrial Plasmid Transcript," <u>Proc. Natl. Acad. Sci. USA</u> 88:8826-8830 (1991)
	*	Scanlon et al., "Ribozyme-Mediated Cleavage of c-fos mRNA Reduces Gene Expression of DNA Synthesis Enzymes and Metallothionein," <u>Proc. Natl. Acad. Sci. USA</u> 88:10591-10595 (1991)
	*	Scaringe et al., "Chemical synthesis of biologically active oligoribonucleotides using β -cyanoethyl protected ribonucleoside phosphoramidites," <u>Nucl Acids Res.</u> 18:5433-5441 (1990)
	*	Schmidt et al., "Base and sugar requirements for RNA cleavage of essential nucleoside residues in internal loop B of the hairpin ribozyme: implications for secondary structure," <u>Nucleic Acids Research</u> 24:573-581 (1996)
	*	Scott et al., "The crystal structure of an All-RNA hammerhead ribozyme: A proposed mechanism for RNA catalytic cleavage," <u>Cell</u> 81:991-1002 (1995)
	*	Shabarova et al., "Chemical ligation of DNA: The first non-enzymatic assembly of a biologically active gene," <u>Nucleic Acids Research</u> 19:4247-4251 (1991)
	*	Stein and Cheng, "Antisense Oligonucleotides as Therapeutic Agents - Is the Bullet Really Magical?" <u>Science</u> 261:1004-1288 (1993)
	*	Strobel et al., "Exocyclic Amine of the Conserved G·U Pair at the Cleavage Site of the <i>Tetrahymena</i> Ribozyme Contributes to 5'-Splice Site Selection and Transition State Stabilization," <u>Biochemistry</u> 35:1201-1211 (1996)
	*	Strobel et al., "Minor Groove Recognition of the Conserved G·U Pair at the <i>Tetrahymena</i> Ribozyme Reaction Site," <u>Science</u> 267:675-679 (1995)
	*	Sullenger and Cech, "Ribozyme-mediated repair of defective mRNA by targeted trans-splicing," <u>Nature</u> 371:619-622 (1994)
	*	Sullenger and Cech, "Tethering Ribozymes to a Retroviral Packaging Signal for Destruction of Viral RNA," <u>Science</u> 262:1566-1569 (1993)
	*	Szostak, " <i>In Vitro</i> Genetics," <u>TIBS</u> 17:89-93 (1993)

EXAMINER

DATE CONSIDERED

EXAMINER: Initial if citation considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication.

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MBHB00-882-I
(400/118)

Serial No.

TBA

**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**

(Use several sheets if necessary)

Applicant:

McSwiggen, et al.

Filing Date:

TBA

Group:

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*	Taira et al., "Construction of a novel RNA-transcript-trimming plasmid which can be used both <i>in vitro</i> in place of run-off and (G)-free transcriptions and <i>in vivo</i> as multi-sequences transcription vectors," <u>Nucleic Acids Research</u> 19:5125-5130 (1991)
*	Tang and Breaker, "Examination of the catalytic fitness of the hammerhead ribozyme by <i>in vitro</i> selection," <u>RNA</u> 3:914-925 (1997)
*	Thompson et al., "Improved accumulation and activity of ribozymes expressed from a tRNA-based RNA polymerase III promoter," <u>Nucleic Acids Research</u> 23:2259-2268 (1995)
*	Torrence et al., "Targeting RNA for degradation with a (2'-5') oligoadenylate-antisense chimera," <u>Proc. Natl. Acad. Sci. USA</u> 90:1300-1304 (1993)
*	Turner et al., "Improved Parameters for Prediction of RNA Structure," <u>Cold Spring Harbor Symposia on Quantitative Biology</u> Volume LII, pp. 123-133 (1987)
*	Turner et al., "Free Energy Increments for Hydrogen Bonds in Nucleic Acid Base Pairs," <u>J. Am. Chem. Soc.</u> 109:3783-3785 (1987)
*	Uhlenbeck, "A Small Catalytic Oligoribonucleotide," <u>Nature</u> 328:596-600 (1987) (this is listed as Nature 327 in the various specifications, but it is actually 328)
*	Usman and Cedergren, "Exploiting the chemical synthesis of RNA," <u>TIBS</u> 17:334-339 (1992)
*	Usman and McSwiggen, "Ch. 30 - Catalytic RNA (Ribozymes) as Drugs," <u>Annual Reports in Medicinal Chemistry</u> 30:285-294 (1995)
*	Usman et al., "Automated Chemical Synthesis of Long Oligoribonucleotides Using 2'-O-Silylated Ribonucleoside 3'-O-Phosphoramidites on a Controlled-Pore Glass Support: Synthesis of a 43-Nucleotide Sequence Similar to the 3'-Half Molecule of an <i>Escherichia coli</i> Formylmethoionine tRNA," <u>J. Am. Chem. Soc.</u> 109:7845-7854 (1987)
*	Usman et al., "Chemical modification of hammerhead ribozymes: activity and nuclease resistance," <u>Nucleic Acids Symposium Series</u> 31:163-164 (1994)
*	Usman et al., "Hammerhead ribozyme engineering," <u>Current Opinion in Structural Biology</u> 1:527-533(1996)

EXAMINER

DATE CONSIDERED

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FORM PTO-1449 (Rev. 2-32)	U.S. Department of Commerce Patent and Trademark Office	Atty. Docket No. MBHB00-882-I (400/118)	Serial No. TBA
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	*	Vaish et al., "Isolation of Hammerhead Ribozymes with Altered Core Sequences by <i>in Vitro</i> Selection," <u>Biochemistry</u> 36:6495-6501 (1997)
	*	Ventura et al., "Activation of HIV-Specific Ribozyme Activity by Self-Cleavage," <u>Nucleic Acids Research</u> 21:3249-3255 (1993)
	*	Weerasinghe et al., "Resistance to Human Immunodeficiency Virus Type 1 (HIV-1) Infection in Human CD4 ⁺ Lymphocyte-Derived Cell Lines Conferred by Using Retroviral Vectors Expressing an HIV-1 RNA-Specific Ribozyme," <u>Journal of Virology</u> 65:5531-5534 (1994)
	*	Wincott et al., "Synthesis, deprotection, analysis and purification of RNA and ribozymes," <u>Nucleic Acids Research</u> 23(14):2677-2684 (1995)
	*	Wincott et al., "A Practical Method for the Production of RNA and Ribozymes," <u>Methods in Molecular Biology</u> 74:59-69 (1997)
	*	Wu-Pong, "Oligonucleotides: Opportunities for Drug Therapy and Research," <u>BioPharm</u> pp20-33 (1994)
	*	Yu et al., "A Hairpin Ribozyme Inhibits Expression of Diverse Strains of Human Immunodeficiency Virus Type 1," <u>Proc. Natl. Acad. Sci. USA</u> 90:6340-6344 (1993)
	*	Yuan et al., "Targeted cleavage of mRNA by human RNase P," <u>Proc. Natl. Acad. Sci. USA</u> 89:8006-8010 (1992)
	*	Zarrinkar and Williamson, "The P9.1-P9.2 peripheral extension helps guide folding of the <i>Tetrahymena</i> ribozyme," <u>Nucleic Acids Research</u> 24:854-858 (1996)
	*	Zaug et al., "The <i>Tetrahymena</i> Ribozyme Acts Like an RNA Restriction Endonuclease," <u>Nature</u> 324:429-433 (1986)
	*	Zhou et al., "Synthesis of Functional mRNA in Mammalian Cells by Bacteriophage T3 RNA Polymerase," <u>Mol. Cell. Biol.</u> 10:4529-4537 (1990)
	*	Zimmerly et al., "A Group II Intron RNA is a Catalytic Component of a DNA Endonuclease Involved in Intron Mobility," <u>Cell</u> 83:529-538 (1995)

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